

Concavity and
The Second Derivative Test Homework

Name _____

Determine the open intervals on which the function is concave up or down.

1. $f(x) = x^3 - 6x^2 + 4$

2. $g(x) = 2x^2 + \ln x ; x > 0$

3. $h(x) = x^4 - 4x^3$

4. $f(x) = \frac{x}{x^2+1}$

Find the points of inflection and discuss the concavity of the graph of the function.

5. $f(x) = 2x^4 - 8x + 1$

6. $f(x) = x\sqrt{9-x}$

7. $f(x) = x \ln x$

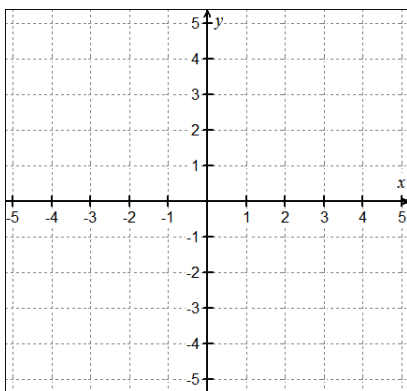
8. $f(x) = xe^{-x}$

9. $f(x) = \sin x + \cos x \quad [0, 2\pi]$

10. $f(x) = \frac{4}{(x^2+1)}$

Sketch the graph of a function f having the given characteristics.

11. $f(0) = f(3) = 0$
 $f'(x) > 0$ if $x < 1$
 $f'(x) < 0$ if $x > 1$
 $f''(x) < 0$



12. $f(-2) = f(4) = 0$
 $f'(2)$ does not exist
 $f'(x) > 0$ if $x < 2$ and $f'(x) < 0$ if $x > 2$
 $f''(x) > 0 \quad x \neq 2$

